

**Title** A physical model to predict climate dynamics in ventilated bulk-storage of agricultural produce

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### **Abstract**

This paper presents a physical model for predicting climate dynamics in ventilated bulk-storage of agricultural produce. A well-ordered model presentation was obtained by combining an object-oriented zonal decomposition with a process-oriented decomposition through matrix–vector notation. The objective of this paper is twofold: (1) to present the modelling procedure and (2) to present the resulting model, validated with real data. The model is a suitable simulator to assess potential effects of changes in ambient climate, design, and controller tunings. The model predictions fit well to extensive real data from three different cases. The good fit for all three cases was achieved with the five calibration parameters calibrated on the basis of data from one case only.